

Reefton Water Supply Improvements



One of the key projects in Buller District Council's Draft Annual Plan 2020/21 is the capital improvements programme for the Reefton water supply.

These improvements include:

- the realignment and replacement of the rising and falling main
- the provision of residual disinfection (chlorination)
- pressure reduction, and
- securing the integrity of the treated water reservoir.

Why is Council planning to do this work?

As a water supplier, it is Council's responsibility to provide drinking water to the standard expected by the Ministry of Health (MOH). This is achieved by complying with the compliance targets defined in the Drinking Water Standards New Zealand 2018 (DWSNZ). Frequent monitoring and testing of water within the treatment plant and throughout the reticulation is undertaken and reported back to Council's drinking water regulator, the Canterbury District Health Board (CDHB), to demonstrate compliance with DWSNZ.

The DWSNZ compliance targets have become increasingly strict in their requirements following the Government inquiry into the Havelock North water contamination incident in 2016. The inquiry produced several key recommendations for public drinking water supplies nationwide. The most notable of these is the recommendation for residual disinfection to be used in all drinking water supplies to protect water against possible recontamination once it has been treated.

The new compliance targets, along with the recent detection of E. coli and fluctuating total coliform counts in the Reefton reticulation, has led the CDHB to make it clear to Council that they will not support lifting the

precautionary Boil Water Notice under the current water supply arrangement at Reefton.

This means that the Reefton water supply will continue to be managed under a precautionary Boil Water Notice indefinitely unless improvements to the Reefton water infrastructure are made.

Council expects that DWSNZ compliance will be restored for the Reefton water supply once works are complete, enabling the precautionary Boil Water Notice to be lifted.

How is Reefton's water currently treated?

Water is drawn from a bore adjacent to the Inangahua River and pumped to the water treatment plant at The Strand where it is pushed through a series of filters, treated by ultraviolet (UV) irradiation and then distributed through the reticulation to consumers.

We already disinfect the water with UV. Why do we have to chlorinate the water as well?

Chlorine and UV provide excellent disinfection of water.

Ultraviolet (UV) light works by inactivating micro-organisms, leaving them unable to reproduce in the human gut. This treatment allows them to pass right through the body without causing any illness. UV light is a highly effective disinfectant at the point of treatment, but doesn't offer any protection from possible recontamination of the water within the reticulation once it has left the treatment plant.

Chlorine is a highly efficient disinfectant that will kill most micro-organisms in the water. Once introduced into a water supply, chlorine will continue to kill any pathogens that it comes into contact with as it passes through the reticulation. This is called a residual disinfectant and this is the major difference between UV and chlorine treatment.

How can the water in the reticulation get recontaminated?

Contaminated water can enter a water supply through cracks in pipework, or through any backflow in the reticulation. Backflow is one of the biggest risks to water supplies and happens when water flows backward from a customer's property into the network. This can happen when pressure drops in the network and causes water (and potentially contaminants) to be sucked or pushed back into the public water supply.

Is chlorine the only solution?

The only alternative to chlorine for residual disinfection is a similar substance called chlorine dioxide. Chlorine dioxide is often used by farmers as a disinfectant for their sheds and it can be used for drinking water as well. Chlorine dioxide produces chlorite which needs to be monitored carefully to avoid any potential harm to people. The application is more difficult which is why it is rarely used for bacterial compliance activities.

Why was chlorine chosen?

Chlorine is safer to use than chlorine dioxide. There is no other disinfectant available which provides residual protection.

I don't like the taste and smell of chlorinated water.

What can be done to improve it?

When previously unchlorinated supplies have chlorine introduced into them for the first time, there can be a change in taste and smell of the water. This is due to the reaction of organic material, usually on the pipe walls, reacting with the chlorine. The compounds created from

this reaction are called chloramines and these chloramines are the cause of the change in taste and smell. Over time the taste and smell should improve as the organic matter disappears, leaving less matter to create chloramines.

Letting drinking water stand for 24 hours in the fridge, or the use of filters (both jug and underbench varieties) can remove the smell and taste.

How safe is chlorine?

Chlorine has been used to safely treat drinking water around the world for around 120 years. It keeps millions of people, including most New Zealanders, safe from waterborne illness.

What is FAC?

When chlorine is introduced to untreated water it gets 'spent' or used up when it reacts with organic matter and micro-organisms. Water treatment plant operators need to ensure that the amount of chlorine left in the water after it has been spent is sufficient to continue to safeguard the water from any possible recontamination throughout the reticulation. This leftover chlorine is called free available chlorine (FAC). The minimum FAC level is specified in the New Zealand Drinking Water Standards (DWSNZ).

What is DWSNZ?

Drinking Water Standards for New Zealand, produced by the Ministry of Health, defines maximum acceptable values (MAV) for organic, inorganic and bacterial elements that may be present in drinking water. These values are set at levels which require the water supplier to act before water quality can cause adverse health effects to consumers. All public water supply operators around New Zealand must comply with DWSNZ.